

Curriculum Vitae

Ning Zhou, Ph.D.

Associate Professor
Department of Communication Sciences and Disorders
East Carolina University
Greenville, NC 27834

A. Education and Training

INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
Ohio University, Athens, US	MA	06/2005	Linguistics
Ohio University, Athens, US	PhD	06/2010	Hearing Sciences
Kresge Hearing Research Institute, University of Michigan	Postdoc Fellow	06/2013	Psychophysics/Cochlear Implants

B. Positions and Honors

ACTIVITY/OCCUPATION	BEGINNING DATE (mm/yy)	ENDING DATE (mm/yy)	FIELD	INSTITUTION/COMP ANY
Teaching Assistant	01/2004	06/2005	Linguistics	Ohio University
Research/Teaching Assistant	09/2005	06/2010	Cochlear Implants	Ohio University
Research Fellow	07/2010	06/2013	Psychophysics/Cochlear Implants	University of Michigan
Adjunct professor	04/2012	06/2013	Acoustic Phonetics	Ohio University
Assistant professor	07/2013	06/2018	Auditory Prosthesis	East Carolina University
Associate professor	07/2018	present	Auditory Prosthesis	University

Academic and Professional Honors

2019

Five-Year Achievement for Research and Creative Activity Award, ECU

2016

Selected as Early Career Reviewer for NIH AUD study section
Dean's award for outstanding performance in research, ECU

2014

The New Investigator Award, American Auditory Society

2011

Student Scholarship, Conference on Implantable Auditory Prostheses

2009

Student Scholarship, the 12th Symposium on Cochlear Implants in Children
Student Scholarship, Conference on Implantable Auditory Prostheses

2008

Student Research and Scholarly Activity Award, Ohio University
Graduate Student Travel Award, Midwinter ARO (Association for Research in Otolaryngology) Meeting
First Place, Ohio University Research and Creative Activity Expo

Dean of Students Citation for excellence in scholarly accomplishments
Herbert J. Oyer Award, Academy of Rehabilitative Audiology
Mentored Doctoral Student Research Poster Session Award from the National Institutes of Health (NIH) and the American Auditory Society (AAS)

2007

Mentored Doctoral Student Research Poster Session Award from the National Institutes of Health (NIH) and the American Auditory Society (AAS)
Graduate Student Senate Travel Grant, Ohio University
College of Health and Human Services Student Research and Scholarly Activity Award, Ohio University
First Place, Ohio University Student Research and Creativity Fair
Dean of Students Citation for excellence in scholarly accomplishments
Student Travel Award, Conference on Implantable Auditory Prostheses

2006

College of Health and Human Services Student Research and Scholarly Activity Award, Ohio University

C. Publications

Peer reviewed publications

1. Xu, L., Zhang, W., **Zhou, N.**, Lee, C.-Y., Li, Y., Chen, X., & Zhao, X. (2006). Mandarin Chinese tone recognition with an artificial neural network. *Journal of Otology*, 1, 30-34.
2. Xu, L., Chen, X., **Zhou, N.**, Li, Y., Zhao, X., & Han, D. (2007). Recognition of lexical tone production of children with an artificial neural network. *Acta Oto-Laryngologica*, 127, 365-369.
3. Han, D., **Zhou, N.**, Li, Y., Chen, X., Zhao, X., & Xu, L. (2007). Tone production of Mandarin-Chinese-speaking children with cochlear implants. *International Journal of Pediatric Otorhinolaryngology*, 71, 875-880.
4. **Zhou, N.**, & Xu, L. (2008). Development and evaluation of methods for assessing tone production skills in Mandarin-speaking children with cochlear implants. *Journal of the Acoustical Society of America*, 123, 1653-1664.
5. **Zhou, N.**, & Xu, L. (2008). Lexical tone recognition with spectrally mismatched envelopes. *Hearing Research*, 46, 36-43.
6. **Zhou, N.**, Zhang, W., Lee, C.-Y., & Xu, L. (2008). Lexical tone recognition by an artificial neural network. *Ear and Hearing*, 29, 326-335.
7. Xu, L., **Zhou, N.**, Brashears, R., Rife, K. (2008). Relative contributions of spectral and temporal cues for phoneme recognition in patients with sensorineural hearing loss. *Journal of Otology*, 3, 84-91.
8. Han, D., Liu, B., **Zhou, N.**, Chen, X., Kong, Y., Liu, H., Zheng, Y., & Xu, L. (2009). Lexical tone perception with HiResolution® 120 speech-processing strategy in Mandarin-Speaking children. *Ear and Hearing*, 30, 169-177.
9. Xu, L., **Zhou, N.**, Chen, X., Li, Y., Zhao, X., & Han, D. (2009). Vocal singing in prelingually-deafened children with cochlear implants. *Hearing Research*, 255, 129-134.
10. **Zhou, N.**, & Xu, L. (2010). The effects of frequency-place mismatch on consonant confusion. *Journal of the Acoustical Society of America*, 128, 401-409.

11. Wang, W., **Zhou, N.**, & Xu, L. (2011). Musical and lexical tone perception with cochlear implants. *International Journal of Audiology*, 50, 270-278.
12. Xu, L., Chen, X., Lu, H., **Zhou, N.**, Wang, S., Liu, Q., Li, Y., et al. (2011). Tone perception and production in pediatric cochlear implants users. *Acta Oto-Laryngologica*, 131, 395-398.
13. Pfungst, B. E. Bowling, S., Colesa, J. D., Garadat, N. S., Raphael, Y., Shibata, S., Strahl, S., Su, L. G., **Zhou, N.** (2011). Cochlear infrastructure for electrical hearing. *Hearing Research*, 281, 65-73.
14. **Zhou, N.**, & Xu, L. Pfungst, B. E. (2012). Characteristics of detection thresholds and maximum comfortable loudness levels as a function of pulse rate in human cochlear implant users. *Hearing Research*, 284, 25-32.
15. Feng, Y., Xu, L., **Zhou, N.**, Yang, G., Yin, S. (2012). Sine-wave speech recognition in tonal language. *Journal of the Acoustical Society of America*. 131, EL133-EL138.
16. **Zhou, N.**, & Pfungst, B.E. (2012). Psychophysically-based site selection coupled with dichotic stimulation improves speech recognition in noise with bilateral cochlear implants. *Journal of the Acoustical Society of America*. 132, 994-1008.
17. Feng, Y., Xu, L., **Zhou, N.**, Yang, G., Yin, S. (2012). The recognition of sine-wave Mandarin Chinese in normal-hearing listeners. *Chinese Journal of Otology*, 10, 178-181.
18. **Zhou, N.**, Huang, J., Chen, X., & Xu, L. (2013). Relationship between tone perception and production in prelingually-deafened children with cochlear implants. *Otology and Neurotology*, 34, 499-506.
19. Liu, Q., **Zhou, N.**, Berger, B., Huang, D., & Xu, L. (2013). A comparative study of Mandarin consonant contrast recognition among children with cochlear implants or hearing aids, and normal-hearing children. *Otology and Neurotology*, 34, 471-476.
20. **Zhou, N.**, & Xu, L. (2013). Melody recognition in dichotic listening with or without frequency-place mismatch. *Ear and Hearing*, 35, 379-382.
21. **Zhou, N.**, & Pfungst, B.E. (2014). Effects of site-specific level adjustment on speech recognition in cochlear implant users. *Ear and Hearing*, 35, 30-40.
22. **Zhou, N.**, & Pfungst, B. E. (2014). Relationship between multipulse integration and speech recognition with cochlear implants. *Journal of the Acoustical Society of America*, 136, 1257-1268. PMC4165232
23. Pfungst, B.E., **Zhou, N.**, Colesa, D.J., Watts, M.M., Strahl, S.B., Garadat, S.N., Schwartz-Leyzac, K.C., Budez, C.L., Raphasel, Y., Zwolan, T.A. (2015). Importance of cochlear health for implant function. *Hearing Research*, 332, 77-88. (**SI Lasker Award**)
24. **Zhou, N.**, Kraft, C.T., Colesa, D.J., Pfungst, B. E. (2015). Integration of pulse trains in humans and guinea pigs with cochlear implants. *Journal of the Association of Research in Otolaryngology*, 16, 523-34.
25. **Zhou, N.**, Pfungst, B. E. (2016a). Evaluating multipulse integration as a neural-health correlate in human cochlear-implant users: Relationship to forward-masking recovery. *Journal of the Acoustical Society of America*, 139, EL70-75.
26. **Zhou, N.**, Pfungst, B. E. (2016b). Evaluating multipulse integration as a neural-health correlate in human cochlear-implant users: Relationship to spatial selectivity. *Journal of the Acoustical Society of America*, 140, 1537-1547.

27. **Zhou, N.** (2016). Monopolar detection thresholds predict spatial selectivity of neural excitation in cochlear implants: implications for speech recognition. *PLoS One*, 11, e0165476.
28. **Zhou, N.** Dong, L. (2017). Evaluating multipulse integration as a neural-health correlate in human cochlear-implant users: Relationship to psychometric functions for detection. *Trends in Hearing*, 21, 1-12.
29. **Zhou, N.** (2017). Deactivating stimulation sites based on low-rate thresholds improves spectral ripple and speech reception thresholds in cochlear implant users. *Journal of the Acoustical Society of America*, 141, EL243-248.
30. **Zhou, N.** Dong, L. Hang, M. (2018). Evaluating multipulse integration as a neural-health correlate in human cochlear-implant users: Effects of stimulation mode. *Journal of the Association for Research in Otolaryngology*, 19, 99-111.
31. Tao, D., Liu, J., Yang, Z., Wilson, B. S., **Zhou, N.** (2018). Bilaterally combined electric and acoustic hearing in Mandarin-speaking listeners: The population with poor residual hearing. *Trends in Hearing*, 22, 1-13.
32. **Zhou, N.**, Cadmus, M., Dong, L., Mathews, J. (2018). Temporal modulation detection depends on sharpness of spatial tuning. *Journal of the Association for Research in Otolaryngology*, 19, 317-330.
33. **Zhou, N.**, Mathews, J., Dong, L. (2019). Pulse-rate discrimination deficit in cochlear implant users: is the upper limit of pitch peripheral or central? *Hearing Research*, 371, 1-10.
34. **Zhou, N.** (2019). Longitudinal effect of deactivating stimulation sites based on low-rate thresholds on speech recognition in cochlear implant users. *International Journal of Audiology*, 23, 1-11.
35. **Zhou, N.**, Dong, L. Dixon, S. (2019). Spectrotemporal modulation sensitivity in cochlear-implant and normal-hearing listeners: Is the performance driven by temporal or spectral modulation sensitivity? *Trends in Hearing*, 24, 1-11.
36. **Zhou, N.**, Zhu, Z., Dong, L., Galvin, J. III. (2020). Effect of pulse phase duration on forward masking and spread of excitation in cochlear implant listeners. *PLoS One*, 15(7): e0236179.
37. **Zhou, N.**, Dong, L. Galvin, J. III. (2020). A behavioral method to estimate charge integration efficiency in cochlear implant users. *Journal of Neuroscience Methods*, 342, 1088022.
38. **Zhou, N.**, Dong, L. Dixon, S. (2020). Forward masking patterns by low and high rate stimulation in cochlear implant users: differences in masking effectiveness and spread of neural excitation. *Hearing Research*, 389, 107921.
39. **Zhou, N.**, Zhu, Z., Dong, L. Galvin, J. III. (2021). Sensitivity to pulse phase duration as marker of neural health across cochlear-implant stimulation sites and patients. *Journal of the Association for Research in Otolaryngology*, 22, 177-192
40. Rothermich, K., Dixon, S., Weiner, M., Capps, M., Dong, L., Paquette, S., **Zhou, N.** (2022). Perception of speaker sincerity in complex social interactions by cochlear implant users. *PLoS One*, 17(6): e0269652.
41. Tao, D., Liu, J., **Zhou, N.** (2022). Acoustic analysis of tone production in Mandarin-speaking bimodal cochlear implant users. *JASA Express Letter*, 2, 055201.
42. Dixit, O., Firszt, J., Holden, T., **Zhou, N.** (2022). Relationship between electrode position and temporal modulation sensitivity in cochlear implant users: Are close electrodes always better? *Hearing Research*, under review.

Book chapter

Xu, L., and **Zhou, N.** (2011). Tonal language and cochlear implants. In F-G., Zeng. R.R., Fay., A.N., P. (Eds.), Auditory Prostheses: New Horizons (pp341-364). Springer Science+Business Media, LLC, New York.

Meeting abstracts

1. Xu, L., Chen, X., **Zhou, N.**, Li, Y., Zhao, X., & Han, D. (2006). Recognition of lexical tone production of children with an artificial neural network. Collegium Oto-Rhino-Laryngologicum Amicitiae Sacrum. Moscow, Russia
2. **Zhou, N.**, Xu, L. (2007). An acoustical, neural-network and perceptual study of tone production in Mandarin-Chinese-speaking children. Midwinter ARO (Association for Research in Otolaryngology) Meeting. Denver, Colorado, USA
3. Chen, X., **Zhou, N.**, Li, Y., Zhao, X., Han, D., Xu, L. (2007). Recognition of lexical tone production by children with an artificial neural network. Midwinter ARO Meeting. Denver, Colorado, USA
4. **Zhou, N.**, Xu, L. (2007). An acoustical, neural-network and perceptual study of tone production in Mandarin-Chinese-speaking children. AAS (American Auditory Society) Meeting. Scottsdale, Arizona, USA
5. Xu, L. **Zhou, N.** (2007). Tone production in Mandarin Chinese speaking children with cochlear implants, CIAP (Conference on Implantable Auditory Prostheses), Lake Tahoe, CA.
6. **Zhou, N.**, Xu, L. (2007). The Effects of spectral distribution of envelopes on lexical tone perception. CIAP (Conference on Implantable Auditory Prostheses), Lake Tahoe, CA.
7. Xu, L., Liu, B., Chen, X., Kong, Y., Liu, H., **Zhou, N.**, Han, D. (2007). Lexical tone perception with HiResolution® 120 speech processing strategy in Mandarin speaking children. The 6th Asia Pacific Symposium on Cochlear Implants and Related Sciences, Sydney, Australia.
8. **Zhou, N.**, & Xu, L. (2008). Evaluation of Mandarin-Chinese tone production with an artificial neural network. Midwinter ARO Meeting. Phoenix, Arizona, USA.
9. Xu, L., & **Zhou, N.** (2008). Evaluation of singing in children with cochlear implants. Midwinter ARO Meeting. Phoenix, Arizona, USA.
10. **Zhou, N.**, & Xu, L. (2008). Lexical tone recognition with spectrally mismatched envelopes. 10th International Conference on Cochlear Implants and Other Implantable Auditory Technology. San Diego, CA, USA.
11. Xu, L., **Zhou, N.**, Chen, X., Li, Y., Zhao, X., & Han, D. (2008). Singing by children with cochlear implants. Collegium Oto-Rhino-Laryngologicum Amicitiae Sacrum. Berlin, Germany.
12. **Zhou, N.**, & Xu, L. (2008). Evaluation of signing in children with cochlear implant. Academy of Rehabilitative Audiology Conference. Portland, Oregon, USA.
13. **Zhou, N.**, Xu, L. (2009). The effects of frequency-place mismatch on consonant confusion. Midwinter ARO Meeting. Baltimore, Maryland, USA.
14. **Zhou, N.**, Xu, L. (2009). Vocal singing by prelingually-deafened children with cochlear implants. AAS (American Auditory Society) Meeting. Scottsdale, Arizona, USA.

15. Xu, L., **Zhou, N.**, Schultz, H., Mendez, B. (2010). Temporal aspects of sine-wave speech. Midwinter ARO Meeting. Anaheim, CA, USA.
16. **Zhou, N.**, Xu, L. (2011). Dichotic stimulation with bilateral cochlear implants: maximizing the two-ear advantage. Midwinter ARO Meeting. Baltimore, Maryland, USA.
17. **Zhou, N.**, Xu, L. Pfungst, BE. (2011). Characteristics of detection thresholds and maximum comfortable loudness levels as a function of pulse rate in human cochlear implant users. CIAP (Conference of Implantable Auditory Prostheses), Alsilomar, California, USA.
18. **Zhou, N.**, Pfungst, BE. (2012). Psychophysically-based site selection coupled with dichotic stimulation improves speech recognition in noise with bilateral cochlear implants. Midwinter ARO Meeting. San Diego, California, USA.
19. **Zhou, N.**, Pfungst, BE. (2013). Comparison of temporal integration and multipulse integration functions in humans with cochlear implants. CIAP (Conference on Implantable Auditory Prostheses). Lake Tahoe, California, USA.
20. **Zhou, N.**, Pfungst, BE. (2013). A psychophysical measure of neural health predicts speech recognition in cochlear implant users. CRASH. Madison, Wisconsin, USA
21. **Zhou, N.**, Kraft, CT. Pfungst, BE., Colesa, DJ. (2014). Integration of electrical pulses by listeners with cochlear implants. 41st Annual Scientific and Technology Conference of the American Auditory Society, Scottsdale, Arizona.
22. **Zhou, N.**, Pfungst, BE. (2014). Relationship between multipulse integration and speech recognition with cochlear implants. Midwinter ARO Meeting. San Diego, California, USA.
23. **Zhou, N.**, Pfungst, BE. (2014) Relationship between a measure for neural health and speech recognition with cochlear implants. Med-EI Apex Meeting. Chapel Hill, NC
24. **Zhou, N.**, Pfungst, BE. (2015). Relationship between multipulse integration and forward masking functions in human cochlear implant users. Midwinter ARO Meeting. Baltimore, Maryland, USA.
25. Pfungst, BE., **Zhou, N.**, Colesa, DJ., Watts, MM., Strahl, SB., et al. (2015). Importance of cochlear health for cochlear-implant function. The Acoustical Society Meeting of America. Pittsburgh, Pennsylvania, USA.
26. **Zhou, N.** (2015). Monopolar detection thresholds predict place specificity of neural excitation. CIAP (Conference of Implantable Auditory Prostheses), Lake Tahoe, California, USA.
27. Schwartz-Leyzac, KC., Colesa, DJ., **Zhou, N.**, Strahl, SB., Raphael, Y., Pfungst, BE. (2015). Clinically-useful measures for processor-fitting strategies. CIAP (Conference of Implantable Auditory Prostheses), Lake Tahoe, California, USA.
28. Colesa, DJ., Schwartz-Leyzac, KC., Hughes, A., Strahl, SB., **Zhou, N.**, Raphael, Y; Pfungst, BE. (2016). Relationship between ECAP measures and cochlear health in awake guinea pigs using measures applicable to human subjects. Midwinter ARO Meeting. San Diego, California, USA.
29. **Zhou, N.** (2016). The trade-off relationship between spatial tuning and multipulse integration in human subjects with cochlear implants. Midwinter ARO Meeting. San Diego, California, USA.
30. **Zhou, N.** (2016). The trade-off relationship between spatial tuning and multipulse integration in human subjects with cochlear implants. The Acoustical Society Meeting of America, Salt Lake City, Utah, USA.

31. **Zhou, N.**, Dong, L. Cadmus, MS. (2017). The relationship between amplitude modulation detection and spatial selectivity of neural excitation in cochlear implant users. Midwinter ARO Meeting. Baltimore, Maryland, USA.
32. Dong, L. **Zhou, N.**, (2017). The relationship between multipulse integration and psychometric function for detection in human cochlear implant users. Midwinter ARO Meeting. Baltimore, Maryland, USA.
33. Pfungst, B.E., Schwartz-Leyzac, K.C., **Zhou, N.**, Colesa, D.J., Hughes, A., Swiderski, D., Raphael, Y., Zawolan T. A. (2017). The importance of neural health for cochlear implant performance. Midwinter ARO Meeting. Baltimore, Maryland, USA.
34. Dong, L., Mathews, J., **Zhou, N.** (2017). Examining spatial neural excitation patterns with varying stimulation rate in cochlear implant users. CIAP (Conference of Implantable Auditory Prostheses), Lake Tahoe, California, USA.
35. Mathews, J., Dong, L., **Zhou, N.** (2017). Pulse rate discrimination improves with spatial broadening of neural excitation in cochlear implant users. CIAP (Conference of Implantable Auditory Prostheses), Lake Tahoe, California, USA.
36. Mathews, J., Dong, L., **Zhou, N.** (2018). Pulse rate discrimination improves with spatial broadening of neural excitation in cochlear implant users. AAA (American Academy of Auditory), Nashville, Tennessee, USA.
37. **Zhou, N.**, Dong, L., Mathews, J., Galvin III, J. (2019). Spread of excitation with increasing pulse amplitude or phase duration with cochlear implants. Midwinter Meeting of the Association for Research in Otolaryngology. Baltimore, Maryland. USA.
38. **Zhou, N.**, Dong, L., Galvin III, J. (2020). Revisiting loudness growth with increasing pulse amplitude or phase duration in cochlear implant users. San Jose, USA.
39. **Zhou, N.**, Dong, L., Dixon, S. (2020). How temporal is temporal modulation detection? The relationship between modulation sensitivity and spectral resolution in cochlear implant users. San Jose, USA.
40. **Zhou, N.**, Zhu, Z., Dong, L., Galvin III, J. (2021). Sensitivity to pulse phase duration as a marker of neural health across cochlear implant recipients and electrodes. Conference on Implantable Auditory Prostheses, Lake Tahoe, California, USA
41. Rothermich, K., Dixon, S., Weiner, M., Capps, M., Dong, L., Paquette, S., **Zhou, N.** (2021). The perception of sarcasm in cochlear implant users. ASHA Convention, Washington, D.C. USA
(**Meritorious Poster**)

Invited Talks

1. "Psychophysically-based site selection and level adjustments improve speech recognition with cochlear implants," (2012 June) Department of Otolaryngology-Head and Neck Surgery Charles J. Krause Lectureship, Ann Arbor, MI
2. "Psychophysically-based site-selection improves speech recognition with cochlear implants," (2012 April) Department of Otolaryngology-Head and Neck Surgery Lawrence-Hawkins Symposium, Ann Arbor, MI
3. "Across-site variation in functional responses of cochlear implants and their relationship with speech recognition," (2014, Jan). Department of Psychology University of Minnesota, Minneapolis, MN

4. "Psychophysical measures of neural health in humans with cochlear implants," (2015 Aug) Department of Otolaryngology, University of North Carolina, Chapel Hill, NC

D. Grants and fellowships

Source: William Demant Fonden (**Awarded**)

Title: "Clinical implications of sensitivity to pulse phase duration in cochlear implants"

Role: **PI**

Amount awarded: \$443,300.00 US (2,701,600 DKK)

Source: NIH NIDCD R01 Research Grant (**Awarded 08/01/2019-07/30/2024**)

Title: "Using psychophysical methods to understand and improve speech recognition in cochlear implant users"

Role: **PI**

Amount awarded: \$ 1,864,945.00

Source: NIH NIDCD R03 Research Grant (**Awarded 04/01/16-03/30/20**)

Title: "Assessing non-invasive measure for neural health in humans with cochlear implants and the clinical implications"

Role: **PI**

Amount awarded: \$ 432,484.00

Source: Hearing Health Foundation Emerging Research Grant (**Awarded 07/01/13-06/30/15**)

Title: "Place specificity of electrical stimulation with a cochlear implant and its relationship to neural survival and speech recognition"

Role: **PI** (research highlighted in Hearing Health Foundation Magazine)

Amount awarded: \$25,000.00

Source: NIH NIDCD T32 Hearing & Chemical Senses Training Grant (**Awarded 07/01/10 - 06/30/13**)

Title: "Customization of speech processor maps in cochlear implant users"

Role: **Post-doctoral trainee PI**

Amount awarded: \$119,000.00

Source: NIH NIDCD F31 Predoctoral Fellows (**Awarded 05/01/09-06/30/10**)

Title: "Music and tone perception with dichotic stimulations"

Role: **Pre-doctoral trainee PI**

Amount awarded: \$116,604.00

E. Professional membership and service

Membership

2005-present

Association for Research in Otolaryngology

2005-present

American Auditory Society

Service

2017-now

Editorial Board of American Journal of Audiology

Ad Hoc reviewer

Acta Oto-Laryngologica

American Journal of Audiology

Ear and Hearing

Hearing Research

Journal of the Association for Research in Otolaryngology
Journal of the Acoustical Society of America
Speech communication
Trends in Hearing

Grant reviewer

NIH Center for Scientific review AUD study section

Jan 2017

Oct 2017

Feb 2020

July 2020

Oct 2021

F. Teaching

Current courses

CSDI 8011 Advanced Acoustics

CSDI 8033 Cochlear Implant Technology and Research

Courses taught in the past

CSDI 8015 Instrumentation and Calibration

CSDI 8031 Speech Perception in the Auditory System

CSDI 8009 Psychoacoustics